Threatened species assessment of Gravel, Magazine and Access tenure, 23-25 February 2024, Nolans Project

ARAFURA RESOURCES

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Appendices

1 INTRODUCTION

EcOz Environmental Consultants (EcOz) has been engaged by Arafura Rare Earths Limited (Arafura) to undertake a threatened species assessment of tenure associated with proposed gravel pits, magazine and access for the Nolans Project – specifically ML33107, EMP33078, EMP33079, EMP33080, EMP33081, EMP33082, EMP33084, EMP33085, AA33279 and AA33280 (collectively referred to as the current development area) (Map 1 in Appendix A). The intent of the assessment is to determine which threatened species occur, or are likely to occur, within the current development area, and (if applicable) recommend mitigation measures to minimise potential impacts to those species. This information will then be used to determine whether the project has the potential to have a significant impact on any of those species.

The outcome of this assessment will be used to inform an *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Self-Assessment, and further approval documentation (if applicable).

To address these requirements, this report presents:

- A desktop threatened species 'likelihood of occurrence' assessment to determine which species have a reasonable chance of occurring within the current development area (to inform which species will require targeted field surveys/assessment).
- Targeted threatened species surveys, outlining survey techniques, survey effort and results.
- Recommended mitigation measures to minimise potential impacts to threatened species considered to be at risk from the proposed activities.
- If applicable, undertake a significant impact assessment for species known or likely to occur within the current development area (using criteria and process defined in the *EPBC Significant Impact Guidelines 1.1*, DoE 2013)

2 DESKTOP REVIEW

To determine which threatened species may occur within the current development area and therefore require targeted field assessment, a desktop threatened species likelihood of occurrence assessment was undertaken (refer to Appendix B). A total of 13 threatened fauna species were assessed (no threatened flora species were identified to potentially occur within search area or surrounds).

The desktop assessment indicated that two threatened species have a reasonable chance of occurring within the current development area, and therefore were subject to targeted field survey and assessment:

- Central Australian Rock-wallaby (*Petrogale lateralis centralis*)
- Southern Whiteface (*Aphelocephala leucopsis*)

The remaining species were either given likelihood ratings of 'Low' or 'None' for the current development area and therefore do not require targeted survey because inherent risk of impact to those species is low / negligible.

The EPBC Protected Matters Search Tool report also identified numerous listed migratory species that are known, or have potential, to occur in the region (Appendix C). However, very few migratory species have been recorded near the current development area because it does not support habitat typically utilised by migratory species that can occur in the region. As such, migratory species have not been targeted in field studies because inherent risk of impact to these species is low / negligible.

3 CENTRAL AUSTRALIAN ROCK-WALLABY

The Central Australian Rock-wallaby (*Petrogale lateralis centralis*) is listed a Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; Commonwealth) and Near Threatened under the *Territory Parks and Wildlife Conservation Act* (TPWC Act; Northern Territory).

Targeted surveys in 2010, 2011 and 2015, and NT Atlas records, confirm that Central Australian Rock-wallaby inhabits rocky ranges and hills located within and surrounding the Nolans project area (GHD 2016). Subsequently, because potentially suitable habitat occurs within and adjacent to the current development area, a targeted field survey was undertaken to confirm if habitat is currently utilised by Central Australian Rock-wallaby and if critical habitat is present. This section describes species background, survey methodology, sampling effort and results for surveys conducted within February 2024.

3.1 Species background

The Central Australian Rock-wallaby is a small to moderately sized macropod, which occurs in rocky habitats throughout central Australia. They emerge in the later afternoon / early evening to feed, and often bask in the sun during the early morning following a cold night (NRETAS 2006).

Critical habitat is rocky habitat with extensive development of caves, crevices and overhangs that allow the animals to escape extremes of weather and to hide from predators (Pearson 2013; Geelen 1999). Suitable vegetation communities (with palatable grasses, herbs and forbs present) need to be near shelter/refugia sites (Pearson 2013). Particularly important food plants are Desert Fig (*Ficus platypoda*) and Spearwood (*Pandorea doratoxylon*) (Blackbourn 1991; Capararo 1994) – however rock-wallaby can be present without these plants being present. Their close association with rocky habitats makes it relatively easy to delineate the habitat that is potentially suitable for rock wallabies to use for shelter. They have a limited foraging zone (usually within 100m of outcrops) which means that their effective shelter and foraging areas can be estimated (Pearson 2013) (foraging distance is often reduced due to predation pressure).

Major threats include predation by introduced species (fox and cat) and to a lesser extent native species (Dingo) (NRETAS 2006; Read and Ward 2011). Habitat degradation caused by changed fire regimes and grazing by introduced herbivores are also a key threat to this species (NRETAS 2006; Read and Ward 2011). With their specific habitat requirements, the species can be limited in their ability to disperse.

3.2 Methodology

Areas of potentially suitable habitat were identified by reviewing vegetation and landform mapping undertaken as part of baseline studies (GHD 2016; LES 2023), aerial imagery and contours. For this survey, all rocky habitat types and steep terrain were considered as potential habitat, and as such, representative survey transects were undertaken within these areas to check for rock-wallaby presence/absence and presence of critical habitat. Survey techniques are described below and follow those recommended in DSEWPC (2011):

- Day-time searches in areas of potential habitat for critical features such as shelter / den sites (caves, rock boulders, rock ledges) and presence of important food plants (Desert Fig and Spearwood).
- Day-time searches for signs of activity, mainly including scats and rock shelters worn smooth from resting, to determine species presence / absence (rock-wallaby have a distinctive scat that can reliably be used to determine species presence).
- Observations / sightings of rock-wallabies basking during the early morning using binoculars from a location on the ground beneath suitable habitat.

Survey transects started at the base of rocky hills and traversed up and along rocky ridge habitat, with surveyors prioritising areas of potential shelter / den habitat and areas of prominent outcrop. The following data was collected for each transect:

- Landform description and photograph
- Vegetation community description, fire history and weed presence
- Presence of suitable refuges / shelter / dens
- Presence / absence of evidence of rock-wallaby (sighting, scat, track)
- Presence / absence of key food plants (herbage, spearwood and desert fig)
- Presence / absence and type of predator scats (cat, fox, dingo)
- Presence / absence and type of other macropod/mammal scats or grazing or sighting

When rock-wallaby scats were identified, the following data was collected:

- Number of scats (within 50m intervals) (data can be used to estimate activity in an area)
- Scat size (i.e. adult or juvenile)
- Scat age (recorded to estimate current inhabitation and previous/recent occurrence):
    - Fresh - black, glossy, 95% intact;
    - Recent – black, some gloss, 70% intact
    - Old – grey or whitish; or black/dark brown with no glossy sheen, <70% intact
- Number and location of recently occupied refuges
- Number and location of unused refuges

3.3 Survey effort

Six survey areas were identified as described in Table 3-1 and shown in Maps 2 to 5 (Appendix A). A total transect length of 18,074 m was surveyed. All transects were undertaken on-foot except for transect 4-3 which was inspected via drone due to heat conditions making ground-access unsafe (also, rocky habitat in this area will not be directly impacted by proposed works as it falls outside the lease area). Survey transects were not required within survey area 6 (AA33279 main access road) because no suitable rocky habitat is present (confirmed during previous pre-clearing surveys in 2022 and 2023 (LES 2022; EcOz 2023).

Table 3-1. Survey effort details

Survey area	Type	Lease(s)	Transect ID	Transect length	Central coordinate	
					Easting	Northing
1	Gravel pit	EMP33078 EMP33079 EMP33080 EMP33083 EMP33084	1-1	1,488m	323164	7491753
			1-2	553m	323288	7491299
			1-3	1,920m	322939	7491008
			1-4	676m	323333	7490675
			1-5	4,101m	322200	7490998
2	Gravel pit	EMP33081 EMP33082	2-1	1,791m	320774	7492571
			2-2	1,216m	320838	7492702
3	Haul road	AA33280	3-1	2,980m	319266	7496934
			3-2	1,046m	319677	7496774
			3-3	839m	319635	7497005
			3-4 (drone only)	1,103m	319918	7498574
4	Magazine	ML33107	4-1	634m	318874	7497522
			4-2	4,255m	319382	7497621
5	Gravel pit	EMP33085	5-1	302m	328304	7490444
6	Main access road	AA33279	NA	NA	NA	NA

3.4 Results

The field survey was undertaken between the 23 – 25 February 2024 by Tom Ewers-Reilly (Lead Ecologist, EcOz), who is an experienced arid zone ecologist working in the region since 2003.

Survey results for each survey area are summarised in Table 3-2. Full details are provided in Appendix D and representative site photographs are provided in Appendix E.

The survey confirmed that Central Australian Rock-wallaby do not currently inhabit rocky habitat found within or adjacent to the current development area (no scats, tracks or sightings). The lack of scat evidence (and data from previous surveys) indicates that habitat has not been used by the species for several years.

Possible den / shelter habitat was identified within survey areas 1, 2, 3 and 4 (see photographs in Appendix E); however, these features may not be of adequate depth to meet temperature requirements of the rock-wallaby and are unlikely to provide protection from predator species (a cat was also flushed from one of these sites). Additionally, important food plants were rarely observed at these locations, and no rock-wallaby scats were found. Euro scats were abundant at all of these locations.

Key predator species (cat, fox and dingo) have been confirmed to occur in the broader area by recent biodiversity monitoring (EcOz 2024, report currently in prep.), as well as cat and dingo observations within rock features during the current survey. The presence of predation pressure reduces the likelihood that habitat within the current development area is suitable for Central Australian Rock-wallaby – because there is no adequate escape terrain / safety refuge in the small isolated hills and ridges (LES 2022).

Central Australian Rock-wallaby are more likely to occur in the larger hills and ridges in the surrounding range system (Reynolds Range) which support higher quality and abundance of shelter sites and key food plants, and presumably less predation pressure (compared to the small isolated hills in the current development area).

Table 3-2. Summary results for each survey area

Survey area	Type	Leases	Survey results summary
1	Gravel pit	EMP33078 EMP33079 EMP33080 EMP33083 EMP33084	No evidence that Central Australian Rock-wallaby occur in this survey area. This area was previously surveyed as part of baseline surveys in 2015 (GHD 2016) and during a fauna survey in 2022 (LES 2022) and evidence of Central Australian Rock-wallaby was also not detected. The isolated rocky hills and central ridgeline within (and surrounding) this area support extensive rocky outcrop with occasional minor overhangs; however no deep caves, crevices or boulder piles were observed. As such, suitable den / shelter habitat for Central Australian Rock-wallaby is not present. Cat and dingo scats were observed in area (predator species). Low abundance of important food plants (One Desert Fig was observed within transect 1-5, Spearwood was not observed in area).
2	Gravel pit	EMP33081 EMP33082	No evidence that Central Australian Rock-wallaby occur in this survey area. This area was previously surveyed during a fauna survey in 2022 (LES 2022) and evidence of Central Australian Rock-wallaby was also not detected. The rocky ridgeline in the centre of this area supports extensive rocky outcrop, minor overhangs and small caves on the south facing slopes. The small cave features may be suitable den habitat (photographs provided in Appendix E); however scat searches at these sites recorded and abundance of Euro scat only, and Euros were sighted at a few of these locations. Dingo scats were observed in area (predator species). No important food plants were observed.

Survey area	Type	Leases	Survey results summary
3	Haul road	AA33280	No evidence that Central Australian Rock-wallaby occur in this area. This area has not been subject to previous survey. The rocky ridges within this area support extensive rocky outcrop with occasional minor overhangs; however no deep caves, crevices or boulder piles were observed. As such, suitable den / shelter habitat for Central Australian Rock-wallaby is not present. Dingo scats were observed in area (predator species). No important food plants were observed.
4	Magazine	ML33107	No evidence that Central Australian Rock-wallaby occur in this area. This area has not been subject to previous survey. This area supports numerous low rocky hills with some minor boulder piles with crevices. None were considered as suitable for den / shelter sites for Central Australian Rock-wallaby. Cat sighting and dingo scats were observed in area (predator species). There is a low abundance of important food plants (two Desert Fig were observed – transects 4-1 and 4-2, and Spearwood had a scattered occurrence in transect 4-2 and was either dead or senesced at the time of survey).
5	Gravel pit	EMP33085	No evidence that Central Australian Rock-wallaby occur in this area. This area was previously surveyed during a fauna survey in 2022 (LES 2022) and evidence of Central Australian Rock-wallaby was also not detected. There is no rocky habitat within this area; however, a low isolated rock hill is present adjacent to the eastern boundary. This low rocky hill does not support suitable den / shelter habitat. No predator species evidence at site. No important food plants were observed.
6	Main access road	AA33279	Targeted surveys were not undertaken due to absence of suitable habitat and this area has been suitably covered in previous pre-clearing reports which indicated no suitable habitat (LES 2022; EcOz 2023). Rocky habitat adjacent to existing track was not suitable for dens / shelter sites. No evidence that Central Australian Rock-wallaby occur in this area. No important food plants were observed.

4 SOUTHERN WHITEFACE

Southern Whiteface (*Aphelocephala leucopsis*) is listed a Vulnerable under the EPBC Act (Commonwealth) and Least Concern under the TPWC Act (Northern Territory). *Note:* Southern Whiteface was not listed as a threatened species under the EPBC Act at the time of EIS approvals (became Vulnerable on 31 March 2023). Previous surveys have recorded Southern Whiteface in the area (GHD 2016). Subsequently, a targeted field survey was undertaken to identify critical habitat and general occurrence within the current development area. This section describes species background, survey methodology, sampling effort and results for surveys conducted within February 2024.

4.1 Species background

The Southern Whiteface is a small stocky finch-like bird, which occurs across most of mainland Australia south of the tropics. They are found in a wide range of open woodlands and shrublands typically dominated by acacias or eucalypts on ranges, foothills and lowlands and plains where there is an understorey of grasses or shrubs, or both (Higgins & Peter 2002; DCCEEW 2023). They feed almost exclusively on the ground for insects, spiders and seeds (Higgins & Peter 2002), and can occur in mixed species feeding flocks (often with Thornbill species) (DCCEEW 2023). They normally breed from July to October (however this is rainfall dependent). They build large bulky domed nest of grass, bark and roots usually in a tree hollow or crack (Higgins & Peter 2002). Critical habitat is as follows (as per DCCEEW 2023):

- Living and dead trees with hollows and crevices which are essential for roosting and nesting.
- Undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both.
- Habitat with low tree densities and an herbaceous understory litter cover (essential foraging habitat)

4.2 Methodology

There is currently no EPBC survey guidelines for Southern Whiteface due to recent listing as a threatened species, as such, the survey was designed based on surveyor experience and focused on identification of critical habitat features as noted in DCCEEW 2023.

Survey techniques were as follows:

- Checked for species presence (opportunistic birdwatching with binoculars).
- Check for the presence of hollows in living and dead trees that could be used for roosting / nesting.
- Check for suitable foraging habitat (herbaceous and grassy understorey litter cover)

Survey effort for this species occurred in conjunction with survey transects as undertaken for Central Australian Rock-wallaby targeted surveys (refer to Section 3.3).

4.3 Results

The field survey was undertaken between the 23 – 25 February 2024 by Tom Ewers-Reilly (Lead Ecologist, EcOz), who is an experienced arid zone ecologist working in the region since 2003.

Southern Whiteface was not recorded during the current survey.

The current development area supports suitable foraging habitat for Southern Whiteface; however, this habitat is widespread throughout the region and is not restricted to the current development area. Cattle grazing occur in the area which has likely significantly reduced foraging habitat quality and condition of critical habitat for this species (i.e. high level of herbaceous and grassy understorey litter cover).

No suspected nest or roost sites were identified; and no tree hollows or tree crevices/cracks suitable for nesting were found. It is unlikely that the area will be used for breeding.

5 CONCLUSION

A desktop review indicated that two threatened species have potential to occur within the gravel, magazine and access tenure for the Nolans Project (ML33107, EMP33078, EMP33079, EMP33080, EMP33081, EMP33082, EMP33084, EMP33085, AA33279 and AA33280) (collectively referred to as the current development area) – Central Australian Rock-wallaby and Southern Whiteface.

Targeted surveys indicate these species do not currently occupy the current development area, and that critical habitat for these species is not present (species summaries provided below). As such, a species-specific significant impact assessment (using the EPBC Significant impact guidelines, DoE 2013) was not undertaken due to inherently low impacts on these species and their populations.

- **Central Australian Rock-wallaby** (Vulnerable EPBC Act). Targeted field survey confirmed that the species does not inhabit the current development area, and that critical habitat is not present (due to absence of good quality den / shelter sites, absence or low abundance of important food plants, and generally high predator occurrence in the area). Proposed works within the current development area will not have a significant impact on the species. As such, the requirement for specific protection buffers and management mitigations for Central Australian Rock-wallaby are not required.
- **Southern Whiteface** (Vulnerable EPBC Act). Targeted field survey did not record species presence however it has been recorded in the general area. Potential habitat for roosting / nesting was not observed within the current development area and is considered unlikely to occur within the proposed disturbance footprints due to absence of tree species that typically support tree hollows and crevices. The current development area could be used for foraging purposes; however habitat is of marginal quality due to cattle grazing and fire impacts, and there is ample areas outside of the current development area that also provide suitable foraging grounds. Minor disturbance to low quality foraging habitat will not impact the species population or reduce species distribution (the current development area is not located on the edge of the species distribution). Proposed works within the current development area will not have a significant impact on the species. As such, the requirement for specific protection buffers and management mitigations for Southern Whiteface are not required.

As part of standard biodiversity management practices for the Nolans project, Arafura have committed to undertaking Pre-Clearing surveys prior to ground disturbance where there is significant biodiversity risk to threatened species and/or threatened species habitat (as per “Ground Disturbance Permit” process in the Nolans Biodiversity Management Plan 2023). Although no specific management measures have been recommended for Central Australian Rock-wallaby, as a precautionary measure (because this species is mobile and known to occur in the surrounding region), it is recommended that the following areas are included in Pre-Clearing surveys to check for species presence:

- **EMP33079** (Survey Area 1): Rocky habitat within proposed disturbance areas, especially habitat in close proximity to the Desert Fig.
- **EMP33081** (Survey Area 2): Rocky habitat on south facing slopes within proposed disturbance areas, especially areas in close proximity to cave sites
- **AA33280** (southern part of Survey Area 3): Rocky habitat within proposed disturbance areas

If Pre-Clearing surveys confirm presence, or likely presence, of Central Australian Rock-wallaby (or any other threatened species), it is recommended the regulator is informed and a suitably qualified person is engaged to confirm identification and propose management measures to ensure that significant impact to the species is avoided.

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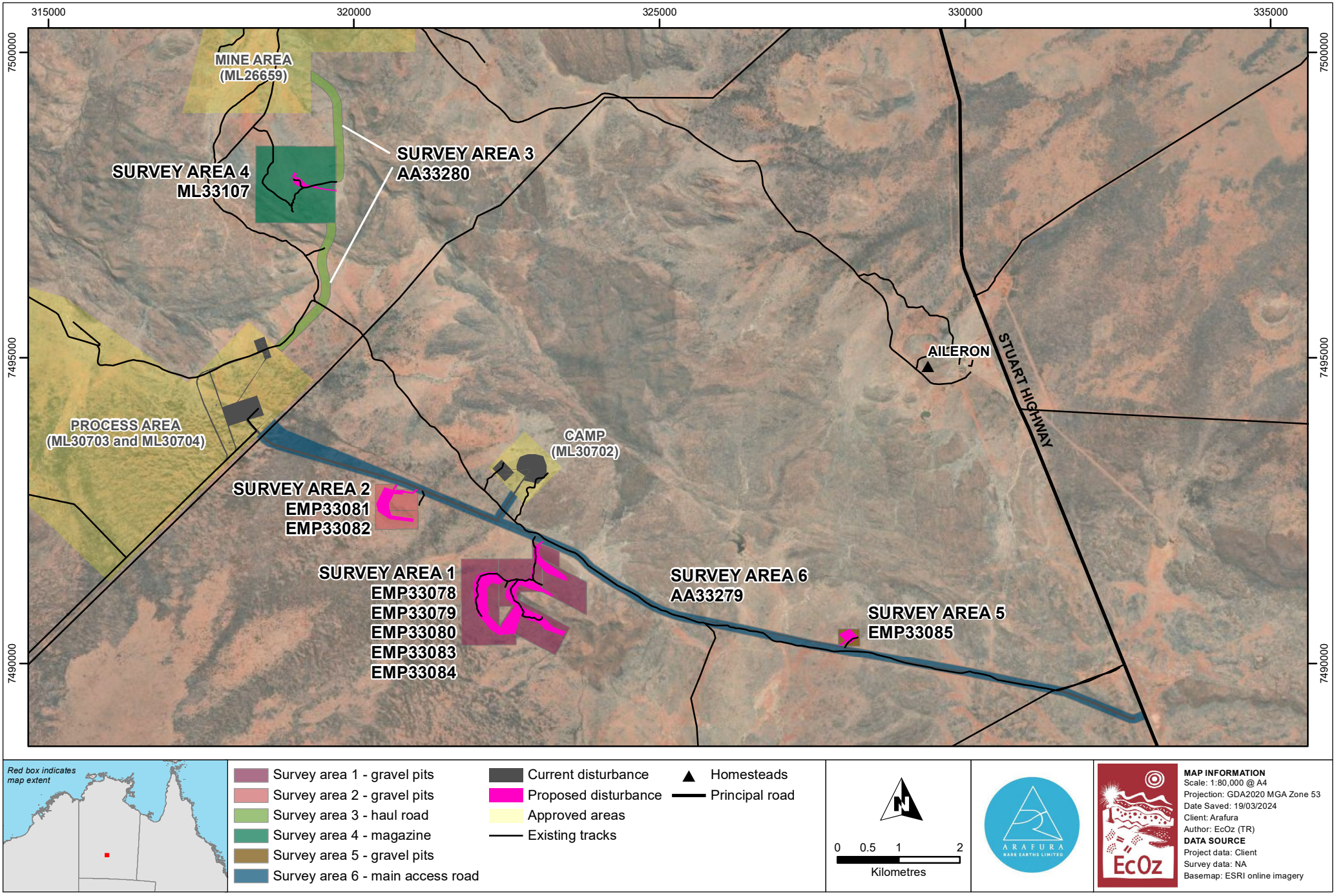
APPENDIX A MAPS



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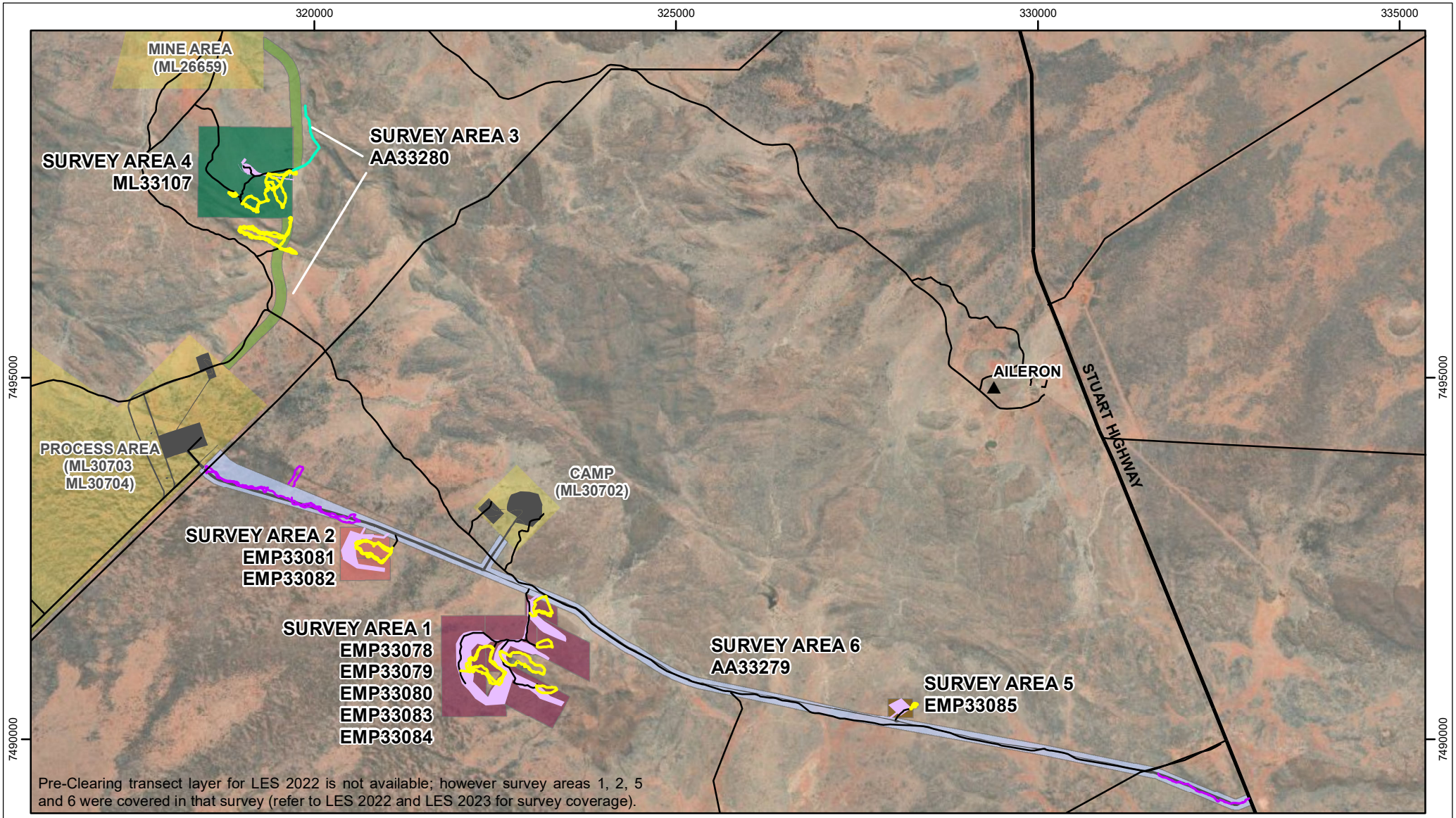
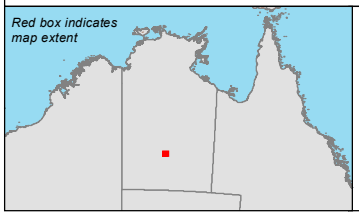
MAP 1. Current development area and Survey Areas, 23 - 25 February 2024





- Survey area 1 - gravel pits
- Survey area 2 - gravel pits
- Survey area 3 - haul road
- Survey area 4 - magazine
- Survey area 5 - gravel pits
- Survey area 6 - main access road
- Current disturbance
- Proposed disturbance
- Survey transect - on-foot
- Survey transect - drone
- Approved areas
- Existing tracks
- Homesteads
- Principal road
- Pre-Clearing tracnsects (EcOz 2023)

N

0 0.45 0.9 1.8
Kilometres

MAP INFORMATION
Scale: 1:80,000 @ A4
Projection: GDA2020 MGA Zone 53
Date Saved: 6/03/2024
Client: Arafura
Author: EcOz (TR)
DATA SOURCE
Project data: Client
Survey data: EcOz Feb 2024
Basemap: ESRI online imagery

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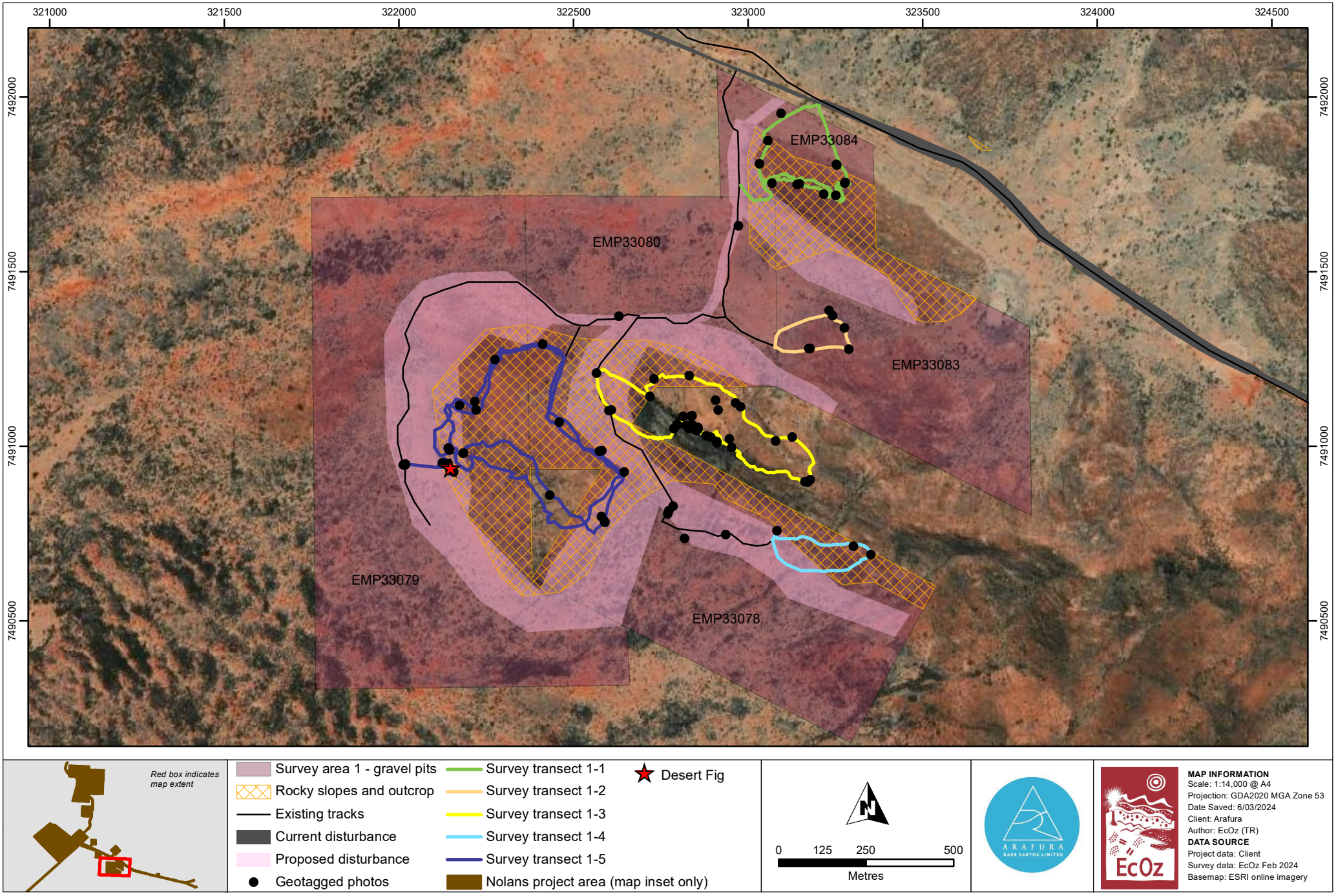
MAP 2. Survey areas and survey effort, 23 - 25 February 2024



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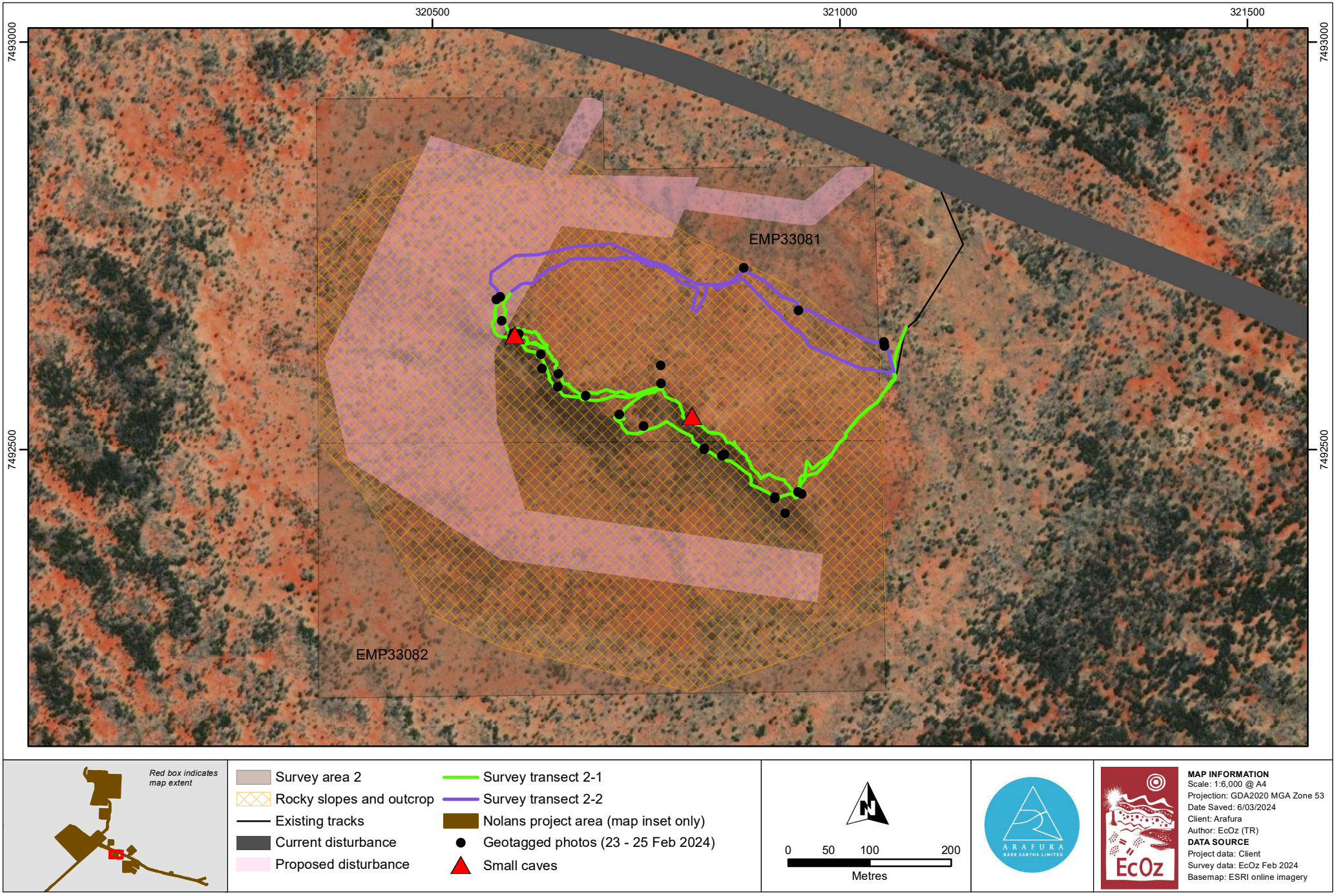
MAP 3. Survey effort: Survey Area 1



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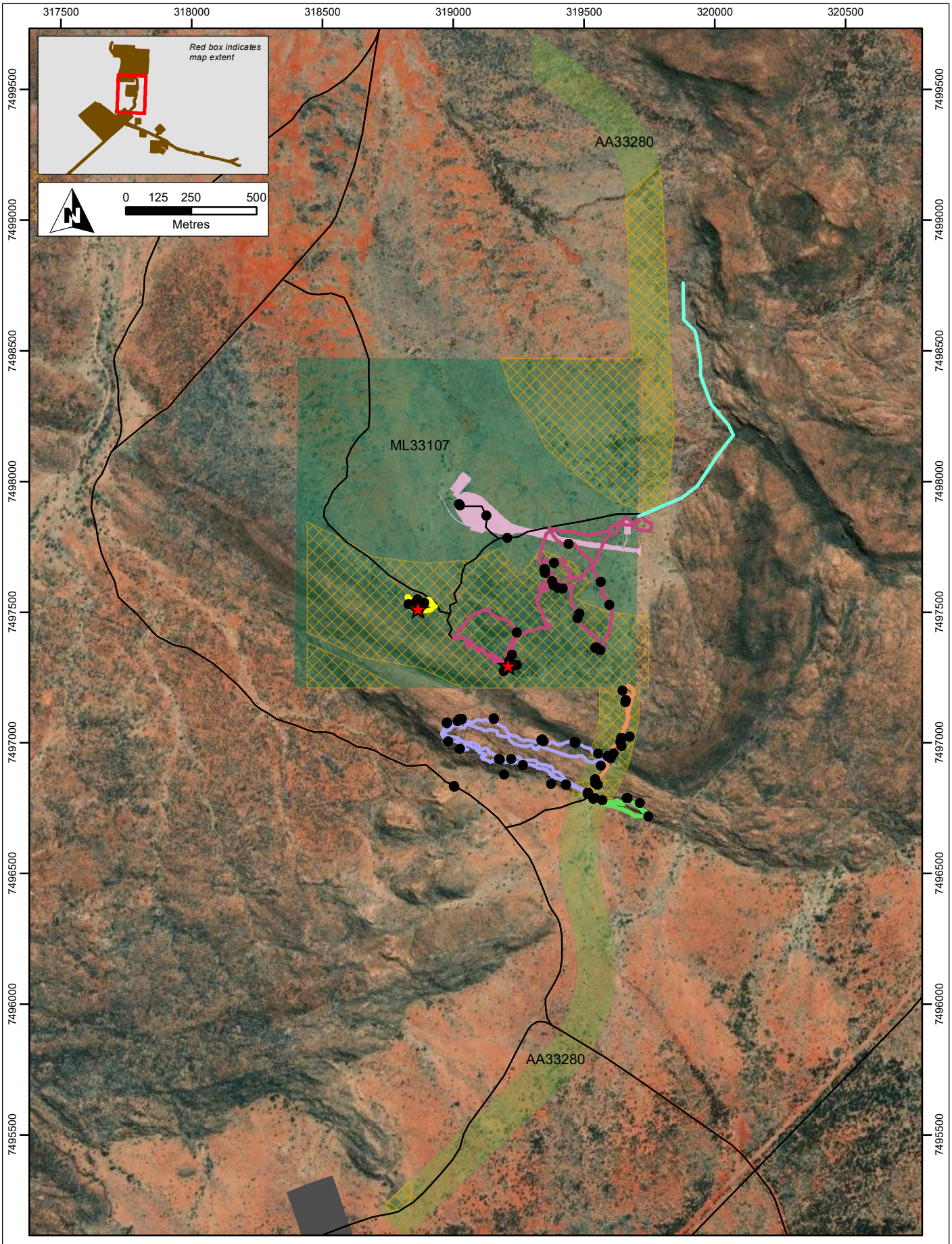
MAP 4. Survey effort: Survey Area 2



Survey area 3 - haul road
Survey area 4 - magazine
Rocky slopes and outcrop
Existing tracks
Current disturbance
Proposed disturbance
Survey transect 3-1
Survey transect 3-2
Survey transect 3-3
Survey transect 3-4
Survey transect 4-1
Survey transect 4-2
Nolans project area (map inset only)
Geotagged photos
Desert Fig

MAP INFORMATION
Scale: 1:20,000 @ A4
Projection: GDA2020 MGA Zone 53
Date Saved: 6/03/2024
Client: Arafura
Author: EcOz (TR)

DATA SOURCE
Project data: Client
Survey data: EcOz Feb 2024
Rocky areas: GHD 2015; LES 2022
Basemap: ESRI online imagery

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MAP 5. Survey effort: Survey Area 3 and 4

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MAP 6. Survey effort: Survey Area 5

APPENDIX B DESKTOP THREATENED SPECIES LIKELIHOOD OF OCCURRENCE ASSESSMENT

The desktop threatened species 'likelihood of occurrence' assessment was undertaken to identify which threatened species have potential to occur within the current development area. This process is based on desktop research and recent onsite studies, and focusses on species that are listed as Vulnerable, Endangered or Critically Endangered under the *Territory Parks and Wildlife Conservation Act* (TPWC Act) and/or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The outcome of this assessment will identify which threatened species require targeted survey effort to enable robust assessment of potential impacts. The procedure is described below and assessment results are summarised in Table A.

Procedure

The following procedure was used to undertake the likelihood of occurrence assessment for each relevant threatened species:

1) Collate a list of threatened flora and fauna records within 50 km of the current development area using the latest NT Flora and Fauna Atlas (dataset download 4 December 2023).
2) Use the Protected Matters Search Tool (PMST) to determine species listed as threatened under the *EPBC Act* (November 2023 – see Attachment 3). A 50 km buffer was applied from the current development area. The PMST is an online enquiry tool managed by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) which interrogates a range of existing flora and fauna data, as well as using predictive modelling, to speculate on the presence of species within a search area.
3) Combine results from steps 2 and 3 to generate a list of species that may occur within the broader area. Species that are extinct are omitted from the assessment (but are in the summary table below).
4) Review details for each of those species – conservation status (Northern Territory and Commonwealth), habitat requirements, distribution, number of records (from the Northern Territory Fauna and Flora Atlas dataset), and presence inferences from the PMST report.
5) Analyse the likelihood that each species will occur within the current development area by applying likelihood ratings defined below. This assessment uses the available records, survey data, and habitat information to infer habitat suitability of the subject area surveyed – available studies are below:
    - Vegetation and landform mapping generated during EIS baseline studies (GHD 2016)
    - Vegetation and landform mapping updates / revisions (LES 2023)
    - Fauna survey data from EIS baseline studies (GHD 2016)
    - Preclearance fauna survey (LES 2022)
    - Preclearance fauna survey (EcOz 2023)

Likelihood	Likelihood of occurrence definition
HIGH	It is expected that this species occurs within the current development area because there is critical habitat and recent (post-2000) records or knowledge that the species occurs in the local area.
MEDIUM	Species may occur within the current development area because there is suitable habitat; however, there is evidence that lowers its likelihood of occurrence (known range contraction of the species in the region, no recent records within or close to the mineral lease, substantial loss of habitat within the mineral lease since previous records, species is naturally-rare or occurs at a low density etc.).
LOW	Species may occur, as a vagrant, within the current development area; only marginally-suitable habitat is expected. No recent records / known occurrences within the region.
NONE	There is strong evidence that this species will not occur within the current development area (i.e. there is no suitable habitat and/or the species is considered to be regionally-extinct).

TABLE A. DESKTOP THREATENED SPECIES LIKELIHOOD OF OCCURRENCE ASSESSMENT – VARIOUS MLs, EMPs and AAs – NOLANS PROJECT – FEB 2024						
Scientific name	**Scientific name**	**TPWC Act**	**EPBC Act**	**Recorded within 50km**	**EPBC PMST**	**Likelihood of occurrence assessment (specific to the current development area using available desktop resources)**
Birds						
Australian Painted Snipe	*Rostratula australis*	EN	EN	No	Species or species habitat may occur in the area	**NONE** • Species requires wetland habitat which is not present within or adjacent to current development area. • No proximate records
Sharp-tailed Sandpiper	*Calidris acuminata*	LC	VU	No	Species or species habitat may occur in the area	**NONE** • Species requires wetland habitat which is not present within or adjacent to current development area. • No proximate records
Curlew Sandpiper	*Calidris ferruginea*	CR	CR	No	Species or species habitat may occur in the area	**NONE** • Species requires wetland habitat which is not present within or adjacent to current development area. • No proximate records
Red Goshawk	*Erythrotriorchis radiatus*	VU	EN	No	Species or species habitat may occur in the area	**LOW** • The current development area outside of known distribution in the NT. • The current development area does not support preferred habitat for the species (prefers tall Eucalyptus forest & riparian areas [Woinarski 2006]). • No proximate records • If present, species would only occur a vagrant.
Night Parrot	*Pezoporus occidentalis*	CR	EN	No	Species or species habitat may occur in the area	**LOW** • No proximate records • No confirmed sightings in the wider region for several decades. • Spinifex habitat on rocky hills could provide suitable roost habitat; however, fire history in the area has likely reduced habitat suitability (Night Parrot requires long unburnt areas of Spinifex for roosting [Pavey 2006] in particular Bull Spinifex *Triodia longiceps* [DOE 2017; Murphy 2017] which is not known to occur in the area).
Grey Falcon	*Falco hypoleucos*	VU	VU	Yes	Species or species habitat likely occur in the area	**LOW** • Only one record within 50km of the current development area. • Species usually nests in the tallest trees along watercourses, particularly River Red Gum and Coolabah, and telecom towers [Falkenberg 2011] – which are not present within the current development area. • Foraging habitat is present within the current development area (however foraging habitat is widespread and not specific to an area – hunting areas typically occur in response to small bird flocks)

TABLE A. DESKTOP THREATENED SPECIES LIKELIHOOD OF OCCURRENCE ASSESSMENT – VARIOUS MLs, EMPs and AAs – NOLANS PROJECT – FEB 2024						
Scientific name	**Scientific name**	**TPWC Act**	**EPBC Act**	**Recorded within 50km**	**EPBC PMST**	**Likelihood of occurrence assessment (specific to the current development area using available desktop resources)**
Southern Whiteface	*Aphelocephala leucopsis*	LC	VU	Yes	Species or species habitat known to occur in the area	**HIGH** • There are proximate records, including those from baseline studies. • The species is relatively common in the southern Northern Territory (hence its listing as Least Concern under TPWC Act). • Suitable habitat is present within the current development area. • Species can forage in a wide range of open woodlands and shrublands. • Roost / nesting habitat occurs in living and dead trees with hollows which are not expected to be present within the current development area.
Princess Parrot	*Polytelis alexandrae*	VU	VU	Yes	Species or species habitat likely occur in the area	**LOW** • Species not known to occur within the current development area. • Species is highly nomadic and could occasionally pass through the area as a vagrant. • There is no suitable breeding / nesting habitat within the current development area (i.e. Marble Gum, River Red Gum and Desert Oak).
Mammals						
Central Australian Rock-wallaby	*Petrogale lateralis centralis*	NT	VU	Yes	Species or species habitat known to occur in the area	**HIGH** • Numerous records in the general area. • Previous targeted surveys in 2015 and 2022 did not detect the species within the current development area (noting that not all areas were checked during those previous surveys). • There is potential for suitable habitat within the current development area (i.e. rocky hills) (requires site assessment to confirm habitat suitability). • The isolated nature of the rocky hills within the current development area may reduce habitat suitability due to increase predation pressure from surrounding plains (cat and fox are known to occur in the area).
Ghost Bat	*Macroderma gigas*	NT	VU	No	Species or species habitat may occur in the area	**NONE** • No records within 50km of current development area. • All records in the greater region are historic. • The species has undergone major distributional changes and, in the NT, is now only known to occur in the Top End. • The species has not been recorded in the southern NT since the early 1960s and is presumed to be regionally extinct/extirpated. • Rocky habitat within the area may support suitable caves for roost sites; however, population contraction to the north deems specie unlikely to occur (as described in above points).

TABLE A. DESKTOP THREATENED SPECIES LIKELIHOOD OF OCCURRENCE ASSESSMENT – VARIOUS MLs, EMPs and AAs – NOLANS PROJECT – FEB 2024						
Scientific name	**Scientific name**	**TPWC Act**	**EPBC Act**	**Recorded within 50km**	**EPBC PMST**	**Likelihood of occurrence assessment (specific to the current development area using available desktop resources)**
Greater Bilby	*Macrotis lagotis*	VU	VU	No	Species or species habitat may occur in the area	**NONE** • No proximate records • Species occurs in spinifex hummock grasslands on sandy soils (Southgate 1990), which are not present within current development area.
Central Rock-rat (Antina)	*Zyzomys pedunculatus*	CR	CR	No	Species or species habitat may occur in the area	**NONE** • No proximate records • Species occurs in high altitude rugged quartzite peaks (now only known to occur in the MacDonnell Ranges) (McDonald 2012) which do not occur within the current development area or surrounds.
Reptiles						
Great Desert Skink	*Liopholis kintorei*	VU	VU	Yes	Species or species habitat known to occur in the area	**NONE** • Species is known to occur 30km to the southwest on spinifex sandplains. • However suitable/critical habitat for the species does not occur within or surrounding the current development area (species generally occurs in tall open shrubland, hummock grasslands on red sandplains and sand ridges, Cogger et al. 1993).

Status key: CR = Critically Endangered, **EN** = Endangered, **NT** = Near Threatened, **LC** = Least Concern

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APPENDIX C EPBC PMST REPORT

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 20-Feb-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	13
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	2
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Macrotis lagotis			
Greater Bilby [282]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petrogale lateralis centralis			
Warru, Central Australian Rock-wallaby [90831]	Vulnerable	Species or species habitat known to occur within area	In feature area
Zyzomys pedunculatus			
Central Rock-rat, Antina [68]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Liopholis kintorei			
Great Desert Skink, Tjakura, Warrarna, Mulyamiji, Tjalapa, Nampu [83160]	Vulnerable	Species or species habitat known to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Glareola maldivarum			
Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
[Glareola maldivarum](#) Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Anna's Reservoir	Conservation Reserve	NT	In buffer area only
Woodgreen	Conservation Reserve	NT	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Nolans Rare Earth Project, NT	2015/7436		Post-Approval	In feature area
Controlled action				
Development of Rare Earth Oxide and Phosphate Mine at Nolans Mine Site	2008/4371	Controlled Action	Completed	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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APPENDIX D FIELD DATA

FIELD DATA – CENTRAL AUSTRALIAN ROCK-WALLABY SURVEY TRANSECTS – NOLANS PROJECT – 23-25 FEBRUARY 2024										
Transect ID	Transect length	Central coordinate		Landform description	Vegetation description	Fire history	Weed presence	Key food plants present?	Rock-wallaby refugia / dens present?	Rock-wallaby evidence	Other mammals observed
		Easting	Northing								
1-1	1,488m	323164	7491753	Low rocky hill with extensive minor outcrop.	Low open shrubland (Acacia, Senna spp.) over tussock grass. Isolated Bloodwood trees. Some patches of spinifex.	Last burnt in 2023	None observed	None observed	None present	None	• Euro (scats) • Red Kangaroo (scats) • Dingo (scats)
1-2	553m	323288	7491299	Low rocky hill with minor outcrop.	Low open shrubland over tussock grass. Isolated Bloodwood trees. Some patches of spinifex.	Last burnt in 2023	Small amounts of Buffel Grass	None observed	None present	None	• Euro (scats) • Red Kangaroo (scats) • Dingo (scats)
1-3	1,920m	322939	7491008	Rocky ridge line with extensive rock outcrop; minor overhangs on southern slopes. Shallow caves or crevices present.	Low open Acacia shrubland over tussock grass and occasional spinifex (low amount of spinifex likely a result of 2023 fire). Scattered small trees.	Last burnt in 2023	Small amounts of Buffel Grass	None observed	Some small caves were found; however all were shallow and not considered deep enough to be suitable for den.	None	• Euro (scats and sighting) • Echidna (scat and sighting) • Rodent (scats)
1-4	676m	323333	7490675	Low rocky hill with minor outcrop.	Low open Acacia shrubland over tussock grass. Scattered small trees. Blue Mallee in area.	Last burnt in 2023	Small amounts of Buffel Grass	None observed	None present	None	• Euro (scats) • Cat (scats) • Dingo (scats)
1-5	4,101m	322200	7490998	Large area of low rocky and gravelly hills with extensive areas of rocky outcrop. Some boulders and minor overhangs. No caves or deep crevices found.	Low open Acacia shrubland over tussock grass and spinifex grass. Scattered Bloodwood, Blue Mallee, Whitewood.	Some patches recently burnt (2024). Many areas haven't burnt for several years.	Small amounts of Buffel Grass	One Desert Fig observed growing out of boulder pile.	None present	None	• Euro (scats) • Red Kangaroo (scats) • Echidna (scat) • Dingo (scats) • Cat (sighting, scat) • Rodent (scats)

FIELD DATA – CENTRAL AUSTRALIAN ROCK-WALLABY SURVEY TRANSECTS – NOLANS PROJECT – 23-25 FEBRUARY 2024											
Transect ID	Transect length	Central coordinate		Landform description	Vegetation description	Fire history	Weed presence	Key food plants present?	Rock-wallaby refugia / dens present?	Rock-wallaby evidence	Other mammals observed
		Easting	Northing								
2-1	1,791m	320774	7492571	Isolated rocky hill with south facing rock faces and extensive outcrop and minor overhangs. Northern slopes shallow outcrop only. Gravelly scree slopes. Some caves and crevices present on the upper south facing slopes.	Low open Acacia shrubland over tussock grass and spinifex grass. Scattered Bloodwood, Blue Mallee, Whitewood, Mulga, Supplejack, Native Current, Ghost Gum.	Not recently burnt	Small amounts of Buffel Grass	None observed	Caves and crevices could be potentially suitable. Although uncommon at site.	None	• Euro (scats and sighting) • Echidna (scats) • Rodent (scats) • Dingo (scats)
2-2	1,046m	320838	7492702	Isolated rocky hill. Northern slopes shallow outcrop only. Gravelly scree slopes.	Low open Acacia shrubland over tussock grass and spinifex grass. Scattered Bloodwood, Blue Mallee, Whitewood, Mulga.	Not recently burnt	Small amounts of Buffel Grass	None observed	None present	None	• Euro (scats)
3-1	2,980m	319266	7496934	Ridgeline with extensive rock outcrop and minor overhangs on the south facing slopes. Northern slopes shallow outcrop only. No caves or deep crevices found.	Scattered shrubs and trees over spinifex.	Not recently burnt	Small amounts of Buffel Grass	None observed	None present	None	• Euro (scats and sighting) • Rodent (scats) • Dingo (scats)
3-2	1,046m	319677	7496774	Ridgeline with extensive outcrop and minor overhangs on southern slopes. Northern slopes shallow outcrop only. Small shallow caves present.	Scattered shrubs and trees over spinifex.	Not recently burnt	Small amounts of Buffel Grass	None observed	None present. Some small caves were found; however all were shallow and not considered deep enough to be suitable for den.	None	• Euro (scats) • Rodent (scats)

FIELD DATA – CENTRAL AUSTRALIAN ROCK-WALLABY SURVEY TRANSECTS – NOLANS PROJECT – 23-25 FEBRUARY 2024										
Transect ID	Transect length	Central coordinate		Landform description	Vegetation description	Fire history	Weed presence	Key food plants present?	Rock-wallaby refugia / dens present?	Rock-wallaby evidence	Other mammals observed
		Easting	Northing								
3-3	839m	319635	7497005	Drainage gully / gap in ridge. Rocky areas but relatively low relief.	Drainage gully supports Melaleuca glomerata (inland paperbark). Rocky areas have a low shrubland of Acacia and Senna spp.	Not recently burnt	Small amounts of Buffel Grass	None observed	None present	None	• Euro (scats) • Cattle (scats, tracks) • Red Kangaroo (scats) • Dingo (scats)
3-4	1,103m (Drone)	319918	7498574	Ridgeline with extensive rock outcrop and overhangs on the west facing slopes.	Scattered shrubs and low trees over spinifex and tussock grasses.	Not recently burnt	Could not determine from imagery	None observed	Potential. Would need to confirm via on-ground survey	NA (didn't check on-ground)	• NA (didn't check on-ground)
4-1	634m	318874	7497522	Isolated low rocky hill with boulders and some crevices/ cracks.	Scattered shrubs and low trees over spinifex and tussock grasses. Caustic Vine, Wild Orange, Desert Fig, Conkerbush, Native Plum, Rock Fuchsia.	Not recently burnt	Small amounts of Buffel Grass	One Desert Fig observed growing out of boulder pile.	None present. Some crevices / caves under boulder piles however not considered to be suitable depth for den site.	None	• Euro (scats) • Echidna (scats) • Rodent (scats)
4-2	4,255m	319382	7497621	Large area of rocky and gravelly hills with extensive areas of rocky outcrop. Some boulders and minor overhangs. No caves or deep crevices found.	Scattered shrubs and low trees over spinifex and tussock grasses. Common shrubs - Acacia spp., Caustic Vine, Wild Orange, Conkerbush, Native Plum, Rock Fuchsia.	Not recently burnt	Small amounts of Buffel Grass	One Desert Fig observed growing out of boulder pile. Spearwood present in some areas however shrubs look dead /senesced	None present	None	• Euro (scats, sighting, carcass) • Cat (sighting) • Echidna (scats) • Rodent (scats) • Dingo (scats)
5-1	302m	328304	7490444	Isolated small rocky hill. Boulders.	Scattered shrubs over tussock grass.	Recently burnt	Buffel Grass common	None observed	None present	None	• Euro (scats)

APPENDIX E SITE PHOTOGRAPHS

Survey transect 1-1

Survey transect 1-2

Survey transect 1-3

Survey transect 1-3

Survey transect 1-3

Survey transect 1-4

Survey transect 1-5

Survey transect 1-5

Survey transect 2-1

Survey transect 2-1

Survey transect 2-2

Survey transect 3-1

Survey transect 3-2

Survey transect 3-3

Survey transect 3-4 (drone inspection only)

Survey transect 4-1

Survey transect 4-2

Survey transect 4-2

Survey transect 5-1

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